IN THE DRAWINGS

A Replacement sheet of drawings showing Figures 14a, 14b and 14c is enclosed for replacing sheet 8 showing Figure 14 of the original drawings. The enclosed drawing amendment labels the three parts of the drawing as Figures 14a, 14b and 14c, respectively, and thereby is in agreement with the specification. Acceptance of the amended drawing is hereby requested.

REMARKS

In the Office Action, the Examiner objected to the drawings, objected to the disclosure, rejected the claims 14 – 16 and 19 – 26 as obvious over Rourke et al in view of Stahl GmbH "Folding Techniques" in view of Yamada, rejected claims 17 and 18 as obvious over Rourke and Stahl and Yamada in view of Iwasaki ad Ahrens, and cited additional references of interest without being relied upon.

Drawing Objection

The original drawing Figure 14 is shown in three parts. The three parts have been referenced in the text as 14a, 14b and 14c but not indicated individually in the drawings. The attached Replacement Sheet shows Figures 14a, 14b and 14c individually labeled, in agreement with the text. The objection is thereby overcome.

The reference character 26 in Figure 14 refers to the cut edges, as indicated in the amended text in the specification, wherein a typographical error is corrected. This reference character is defined in the part number listing at the back of the translation of the international application.

The levels E5 – E8 are shown in the drawing Figure 15, but mentioned in the text only as being in a level structure 51 having twice the number of levels as the levels E1 – E4 of level structure 50. This oversight is corrected. The identity of the levels is E5 – E8 clear from the text and does not add new matter.

No new matter is added by the changes.

Acceptance of the proposed changes is hereby requested.

Disclosure Objection

The change suggested by the Examiner has been entered in the specification. Applicants note that the Examiner appears to be referring to the Marked Up Specification, rather than the Substitute Specification. Applicants have amended the application by reference to the Substitute Specification.

35 USC 103(a)

The Rourke reference (US 5,398,289) does disclose, as asserted by the Examiner, that at least one parameter is defined for the recording medium. In Rourke, the parameter is the thickness of the copy sheets 108. (See column 7, line 28). As such, Rourke provides that the parameter is only used to determine the number of signatures 170 (see column 7, lines 8 – 29 and in particular line 10). However, Rourke fails to disclose that the same parameter is used to implement a position correction of the print image on the pages before printing, as provided in the present claims.

The portion of Rourke referenced by the Examiner (column 10, line 13 – 55) is asserted as showing the one parameter used for a position correction. This passage of the reference, however, fails to refer to the one parameter (the thickness of the sheets) that is mentioned in column 7, lines 8 – 28 of Rourke. Instead, the process and calculation of shift increments x and extra shift increments x' shown in Figure 19 of Rourke are controlled by the defined shift increment 245, which is programmed manually by the operator using the icon 242 (see column 9, line 66 to column 10, line 19 and in particular column 10, lines 3 and 4 to lines 13 and 14).

Therefore, according to Rourke, the operator must manually determine and input via the icon 242 which basic intra-segment shift 245 increment (x) is appropriate. This operation is time consuming and requires a skilled operator having considerable experience.

The automatic calculation of shifts in signatures as disclosed in Rourke at column 10, lines 14 – 28 is restricted to corrections within succeeding signatures, but requires that the operator provide the basic increment selection and determination, as explained above.

The present invention has an advantage over Rourke in that the determination of the correction parameter for the position correction is rather easy for the operator because it is a parameter directly related to the recording medium such as weight or thickness of the recording medium which is easily determined even by an operator who may be less skilled. Based on this easily determined parameter, the image correction shift parameters may be

automatically calculated according to the present invention. This is accomplished from the first signature without needing further operator interaction.

The claims of the present application have been amended to claim the feature of printing the print data on a web-shaped recording medium. In the preferred embodiment, the print data is first printed on a web-shaped recording carrier and the recording carrier is then cut into single sheets and the single sheets are folded into signatures. As such, the reference to printing at least one sheet in the claims includes such process.

None of the cited references disclose a position correction for signatures by applying to print data which is printed on a web-shaped recording carrier. The problems and issues of printing on web-shaped print carriers are significantly different than those for producing signatures that are printed directly on single sheets. An important difference is that the web-shaped recording carriers enable signatures to be produced that have a nearly unlimited number of pages because the web shaped carrier is for all practical purposes endless, whereas this is not so with single sheet recording carriers. The web shaped recording carrier enables more flexibility and more varieties in signature patterns.

It is more technically complex to support signatures on a web-shaped recording medium, with its huge range of numbers of pages. While it is possible to determine and reuse image correction values for recurring signature patterns because the signatures are fixed or at least limited in number for single sheet printing, it is often necessary to individually determine the correction failures for any new signature pattern created on web-shaped recording carriers.

The present invention enables an automated calculation of these correction values and just requires input of an easily determined parameter of the recording carrier.

With reference to the claims, the feature is added that the recording medium is web-shaped. Given such recording media, the division of the print pages and the number of pages per signature is not inevitably established. On the one hand, signatures with varying page extent can thereby be produced. Furthermore, it is possible to provide a plurality of folds for a signature, both with regard to the fold axes and with regard to the order of the foldings. Finally, not only are the foldings simulated by means of the inventive computer program, but

rather it is also checked whether they lead to a specific page order. A per-page correction of the print image is implemented by means of the parameter of the recording medium in order to ensure the in-register succession for pages.

The newly-added feature is, for example, disclosed in Figure 1 (paper web 6).

In contrast to the method shown in Rourke, which is used only on individual sheets, the present invention provides to position a plurality of pages on a web-shaped recording medium and to fold a larger segment of the web multiple times, and finally to cut the web in order to obtain a signature. Contrarily, in the method shown in Rourke US 5,398,289 it is necessary to place various separate individual sheets atop one another with high precision, to fold them and thereby to apply the register correction per sheet and per page. In contrast to the method shown in Rourke, the present invention has the advantage that the folded sheets of a signature are permanently connected with one another until they are cut, such that in practice they no longer experience displacement relative to one another as soon as all foldings are conducted.

Also, contrary to the reference cited in the action, according to which the production of newspapers or books with large printed sheets succeeds without a folding of the print goods, cannot lead to the present invention since, in the processing of printed sheets, it is established in advance how many pages of a signature are positioned on the printed sheet and how these are possibly folded. Contrarily, given a web-shaped recording medium it is possible to provide individual paper web lengths for each signature. According to the invention it is therefore also provided to implement a corresponding check of the page positions and of the possible folding for each signature. A paper length adapted to the number of the signature pages can hereby be selected per signature, and a not-insignificant quantity of under-printed [blanked] maculature pages is therewith prevented.

In the use of web-shaped recording media in connection with the foldings in two different directions and the checking of the page positions, a decisive advantage can thus be seen relative to the known imposition method. The present invention enables a very flexible production of print goods waste (maculature) being produced. For example: according to the

previously known method for printed sheets, for a book that comprises three signatures with 16 pages but has only 40 pages in length each it would be necessary to either leave 8 excess pages of the signature in the brochure as unprinted remaining pages or to discard these 8 pages as maculature. In contrast to this, the present invention enables two signatures of 16 pages and one signature of 8 pages to be generated. The invention thus enables different requirements with regard to the signature division of print goods to be reacted to very flexibly.

Not only the extent of the pages but rather also the distribution of the pages as well as the type and the distribution of the foldings can thereby be individually, freely configured for each signature. The foldings can be handled very flexibly, to the point of the zigzag [fanfold] foldings shown in Figure 15.

Using the page distribution defined by the user on the paper web, the computer program provided in the present invention thereby checks whether this paper web can be folded so that it comprises the document pages in the correct read order after folding and cutting.

The invention thus far exceeds a rough aggregation of features or, respectively, extension of the correction method known from Rourke on two perpendicular axes. Rather, it enables a significantly more flexible reaction to print requirements relative to methods in which printed sheets of predetermined formats are used for generation of signatures.

As already described in the introduction of the specification, for production of relatively small print runs and for what is known as Print on Demand (in which the signatures and therewith the print image displacements must be re-determined for every new print job) it is very advantageous to be able to freely select the signature size based on the continuous carrier material used. A large variability with regard to the length of the recording medium and therewith the size of the signature is provided by the continuous carrier material.

Given the position correction in newspaper printing, the signature size is essentially dependent on the size of the printed sheets used in the offset printing due to the offset printing with which the newspapers are generally produced. These printed sheets are then always folded according to the same fold scheme, whereby the positions of the print images are

already displaced in terms of their position in the layouts of the newspaper such that they generally lie atop one another in register after the printing. Due to this manual position correction implemented in the layout of the newspaper, incorrect displacements of the print images can be conducted by operating personnel, in particular given large signatures and given atypical signature foldings.

In contrast to this, in the inventive method the respective print image is displaced corresponding to a simulation of the folds of the recording medium necessary for generation of the signature, whereby errors in the displacement of the print image are precluded, whereby nearly arbitrary signature sizes can be generated via the continuous recording medium.

The correction values for displacement of the individual print pages are determined from a parameter of the carrier material. In contrast to the Rourke reference, operating personnel thus do not have to directly input the correction value or, respectively, a correction base value, but must only input a parameter of the carrier material that is well known to the operating personnel, for example the specific paper weight of a paper web. Further influencing factors (such as, for example, technical parameters of the printing device and/or post-processing device) can thereby be taken into account without the operating personnel having to know a displacement value from the parameter of the carrier material and the technical parameters to be taken into account of the print and/or post-processing devices.

From Rourke it is known to select the size of the printed sheets such that only one folding is necessary. Foldings in two perpendicular directions are not known from Rourke. The average man skilled in the art thus also receives from Rourke no indication to implement foldings in two perpendicular directions. The average man skilled in the art thus also receives no indication to implement the position correction in two perpendicular directions. The simple summation of the displacement values from Rourke depending on the position of the print page in the signature can not be applied without further measures to the necessary print image displacement given a plurality of foldings in perpendicular directions. The determination of the displacement values is in particular very complex and cannot be overlooked by operating personnel without further measures in the generation of the signature.

A plurality of test printouts and corrections are often necessary in order to obtain an in-register signature. This is connected with significant costs due to the downtimes of the material usage, in particular given small runs. Trained technical personnel are also necessary for such a signature adaptation. For example, given what is known as Print on Demand this cannot be realized with justifiable effort. In known methods for per-signature preparation as described in Rourke, these have therefore been limited to individual sheets that are only folded in one direction. If applicable, larger printed sheets were cut up before the folding so that foldings were only necessary in one direction.

The displacement values of the print images can be automatically determined with the aid of the parameter of the carrier material. This ensues precisely, as operating personnel can implement this with the aid of test printouts and experiential values. A high quality of the print results and a secure operation of the printing device are thereby ensured. Incorrect print results are avoided.

The Stahl and Yamada references would not, even if combined with the Rourke reference, obviate the claimed invention. Applicants note that the Rourke, Stahl and Yamada references were cited in the corresponding European application and that the European patent has been granted over this art.

Favorable reconsideration of the present application over the cited art is hereby requested.

Additional Art

The additional art cited by the Examiner but not relied upon is noted by the Applicants.

Conclusion

Applicants respectfully request favorable reconsideration and allowance of the present application.

Respectfully submitted,

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